RA-15-074

10 CFR 50.73

August 24, 2015

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555 - 0001

Oyster Creek Nuclear Generating Station
Renewed Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Licensee Event Report (LER) 2015-001-01, Reactor SCRAM due to EPR Failure during MPR Troubleshooting

Enclosed is Revision 01 to LER 2015-001, Reactor Scram due to EPR Failure during MPR Troubleshooting. This revision includes additional information from the Root Cause Report and subsequent Corrective Actions from the event. This event did not affect the health and safety of the public or plant personnel. This event did not result in a safety system functional failure. There are no regulatory commitments made in this LER submittal.

Should you have any questions concerning this letter, please contact Michael McKenna, Regulatory Assurance Manager, at (609) 971-4389.

Respectfully,

Jeffrey P. Dostal
Plant Manager
Oyster Creek Nuclear Generating Station

Enclosure: NRC Form 366, LER 2015-001-01

cc: Administrator, NRC Region I
NRC Senior Resident Inspector - Oyster Creek Nuclear Generating Station
NRC Project Manager - Oyster Creek Nuclear Generating Station

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NRC FORM 366 (01-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

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4. TITLE

Reactor SCRAM due to EPR Failure during MPR Troubleshooting

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	N/A
03	22	2015	2015	- 001	- 01	08	12	2015	FACILITY NAME N/A	DOCKET NUMBER N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
N	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
1%	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Michael McKenna, Regulatory Assurance Manager	(609) 971-4389

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	PC	EC	G080	Y	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO		N/A	N/A	N/A

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On March 22, 2015 at 1414, an automatic SCRAM from full power operation occurred at Oyster Creek due to a valid RPS actuation on APRM Hi-Hi flux. The APRM Hi-Hi flux was caused by a rise in reactor pressure due to the failure of the Electric Pressure Regulator (EPR). The backup Mechanical Pressure Regulator (MPR) did not limit reactor pressure.

The scram occurred due to inadvertent contact with degraded wiring during troubleshooting to isolate a DC ground identified within the turbine control indication circuitry. The contact caused a loss of signal from the EPR to its controlling Programmable Logic Controller (PLC) resulting in a loss of the EPR. This loss of signal, concurrent with the MPR being out of position, resulted in the subsequent rise of both reactor pressure and APRM flux that caused the SCRAM.

ENS 50916 was submitted on March 22, 2015 as required by 10 CFR 50.72 (b)(2)(iv)(B). This issue is reportable under 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B).

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Description of Event

On March 19, 2015 the EPR was in control of reactor pressure and the MPR was set as the backup regulator. At 2128, Oyster Creek received a ground on the DC-A bus (9XF-8-a). The DC ground caused the indicating light for the MPR to illuminate while the EPR was in control. Operations validated the EPR was in control and had reasonable assurance the MPR was available as the backup regulator.

On March 20, 2015 at 0944, an AC ground was received which removed multiple indications in the Main Control Room (MCR) including the MPR relay position and pressure set-point position. The last known MPR relay position was 10% from the EPR relay position.

On March 21, 2015, troubleshooting on the DC ground was in progress. At 2115, a lead was lifted and the MPR positon indication light bulb was removed, isolating the DC ground to the circuit for the MPR "In control" light. This circuit contains the MPR "In control" light bulb socket in the MCR and the associated mechanical limit switch, FRS-1, in the Front Standard.

On March 22, 2015, the execution of a troubleshooting action plan (TSAP) determined that the FRS-1 limit switch and associated wiring were the source of the ground. Additionally, it was identified that the limit switch compartment contained water, and wire insulation was degraded within the switch compartment. The source of this water was a local steam leak from the MPR sensing line that had been present since the 1R25 startup. At approximately 1300, replacement of the FRS-1 limit switch and its degraded wires was pursued.

On March 22, 2015 at 1414, while tracing out the FRS-1 wires to be replaced in a junction box containing various Turbine Controls wiring in the Front Standard, EPR wiring was disturbed and the EPR circuit failed. The MPR relay position was at ~22% away from the EPR, which allowed reactor pressure to peak at 1036.6 psig and the reactor to SCRAM on APRM Hi-Hi flux.

Analysis of Event

Following the actuation, all systems responded as expected; therefore, this event is of low safety significance.

Cause of Event

Subsequent troubleshooting determined that the cause of the EPR failure was due to a loss of a control valve position feedback signal to the EPR circuitry from a linear variable differential transformer, DT-1. This signal was grounded, and as a result, the EPR circuitry defaulted to close the Turbine Control Valves which raised reactor pressure. Failure analysis of a grounded connector plug and wiring associated with DT-1, determined that insulation on individual wires within the wiring bundle was significantly degraded due to age (e.g., stiff, brittle insulation), and was internally grounded. This degraded wire was inside the junction box, and in the immediate vicinity of the FRS-1 switch wires being traced out by the DC ground troubleshooting team at the time of the EPR failure. Interviews concluded that this wire was disturbed during this evolution and caused the EPR failure.

Corrective Actions

The corrective actions to address the Root Cause of the EPR failure and the probable cause of the MPR failure, associated with the sensing line steam leak, were completed during Forced Outage 1F36 following the SCRAM March 2015.

Additional Corrective Actions to be completed:

1. Complete the 1R26 Front Standard Inspection for degraded wiring and evaluate and replace as appropriate.
2. Document EPR degraded wiring and DT-1 (Differential Transmitter) was replaced.
3. Schedule an inspection of wiring, insulation and terminations in the Front Standard for degradation and evaluate and replace as appropriate for the 1R26 Fall 2016 outage.
4. Document repair of MPR Sensing Line steam leak.
5. Document restoration of MPR Position Indication.

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6. Confidence Run – observe MPR indication and function through August 2015 to provide confidence it works correctly following repair in May 2015. Document it is working satisfactorily or document new IR number if there are any concerns.
7. Duty Station Management assigned the Contributing Causes to drive Corrective Actions using the Risk Management and Decision Making process.

Previous Occurrences

There were no previous occurrences of wiring degradation leading to a SCRAM at Oyster Creek as identified in the Root Cause Report.